YELLOW PERCH TASK GROUP
EXECUTIVE SUMMARY REPORT
MARCH 2019

Lake Erie Committee

REPRESENTING THE FISHERY MANAGEMENT AGENCIES OF LAKE ERIE AND LAKE ST. CLAIR

2018 Fisheries Review

The lakewide total allowable catch (TAC) of Yellow Perch in 2018 was 10.498 million pounds. This allocation represented a 1% increase from a TAC of 10.375 million pounds in 2017. For Yellow Perch assessment and allocation, Lake Erie is partitioned into four management units (MUs; Figure 1). The 2018 TAC allocation was 3.031, 3.237, 3.776, and 0.454 million pounds for MUs 1 through 4, respectively. The lake-wide harvest of Yellow Perch in 2018 was 6.782 million pounds, or 65% of the total 2018 TAC. This was a 13% decrease from the 2017 harvest of 7.789 million pounds. Harvest from MUs 1 through 4 was 2.326, 1.830, 2.323, and 0.303 million pounds, respectively (Table 1). The portion of TAC harvested was 77%, 57%, 62%, and 67%, in MUs 1 through 4, respectively. In 2018, Ontario harvested 4.614 million pounds, followed by Ohio (1.976 million lbs.), Michigan (0.108 million lbs.), Pennsylvania (0.056 million lbs.), and New York (0.029 million lbs.).

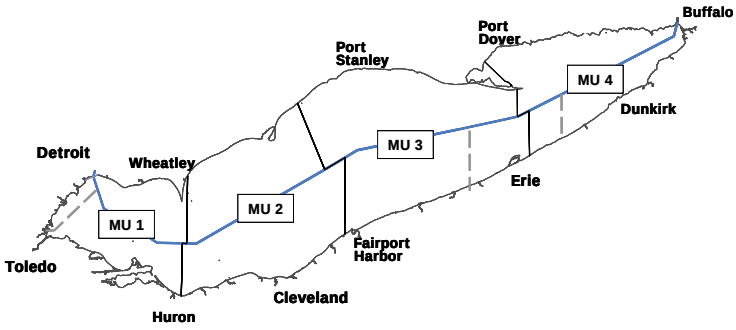

Figure 1. Yellow Perch Management Units (MUs) of Lake Erie.

Targeted (i.e., small mesh) commercial gill net effort in 2018 decreased from 2017 in MU1 and MU2 (-9%, and -2%, respectively), but increased in MU3 and MU4 (+9%, and +57%, respectively). Sport angling effort in U.S. waters decreased in 2018 from 2017, in all management units, by 35%, 62%, 84%, and 41% in MU1, MU2, MU3, and MU4 respectively, and was at its lowest for the time series in MU2 and MU3. Compared to 2017, commercial trap net effort (lifts) in U.S. waters in 2018 decreased by 9% in MU1, 40% in MU2, and 35% in MU4, but increased by 32% in MU3. Fishing effort by jurisdiction and gear type is presented in Table 2.

Targeted gill net harvest rates in 2018 increased relative to 2017 rates by 8% in MU1, and decreased by 14% in MU2, 19% in MU3, and 2% in MU4. Angling harvest rates, in fish harvested per angler hour, decreased in Michigan (-47%) and Ohio waters of MU1 (-11%), and Pennsylvania waters of MU3 (-85%) and MU4 (-72%), but increased in the in Ohio waters of MU2 (+21%) and MU3 (+34%), and New York waters of MU4 (+13%). In 2018, trap net harvest rates increased in MU1 (+8%), MU2 (+48%), and MU4 (+33%), and decreased in MU3 (-25%) compared to 2017 harvest rates.

Table 1. Lake Erie Yellow Perch harvest by jurisdiction and gear type for 2018.

MU	Harvest by jurisdiction (lbs)								Total (lbs)
	Michigan	Ontario	Ohio		Pennsylvania		New York		
	sport	all commercial*	sport	commercial trap net	sport	commercial trap net	sport	commercial trap net	
1	107,789	1,262,229	516,296	439,720					2,326,034
2		1,271,365	30,888	528,234					1,830,487
3		1,807,645	21,564	439,233	2,992	51,093			2,322,527
4		272,733			1,452	0	18,502	10,657	303,344
Total	107,789	4,613,972	568,748	1,407,187	4,444	51,093	18,502	10,657	6,782,393

*Small mesh gill net, large mesh gill net, trap net (MU1), and incidental trawl (MUs 2-4) harvest combined.

Table 2. Lake Erie Yellow Perch fishing effort by jurisdiction and gear type for 2018.

MU	Effort by jurisdiction							
	Michigan	Ontario	Ohio		Pennsylvania		New York	
	sport (angler hours)	commercial (km gill net)*	sport (angler hours)	commercial (trap net lifts)	sport (angler hours)	commercial (trap net lifts)	sport (angler hours)	commercial (trap net lifts)
1	137,930	5,143	500,695	3,500				
2		5,964	45,683	1,551				
3		5,204	16,805	2,233	7,836	324		
4		887			3,940	0	19,035	135
Total	137,930	17,198	563,183	7,284	11,776	324	19,035	135

*Targeted small mesh gill net effort only.

Abundance Estimate for 2019

Population size for 1975 to 2019 for each MU was estimated by statistical catch-at-age analysis (SCAA). The PR ADMB model incorporates a recruitment index which is used to project total abundance estimates to 2019. Using the PR model, abundance estimates of age-2-and-older Yellow Perch in 2019 are projected to decrease by 3%, 1%, and 25% in MU1, MU2, and MU4, respectively, and to increase by 13% in MU3, compared to the 2018 abundance estimates. Age-2-and-older Yellow Perch abundance in 2019 is projected to be 38.237, 45.871, 85.684, and 13.911 million age-2-and-older Yellow Perch in MUs 1 through 4, respectively. Using mean weight-at-age information from assessment surveys, biomass estimates in 2019 are projected to decrease in MU1 (-19%), MU2 (-18%), and MU3 (-3%), and be approximately the same in MU4 (-0.1%), compared to 2018 estimates.

Recommended Allowable Harvest (RAH) for 2019

In 2019 the Lake Erie Percid Management Advisory Group (LEPMAG) completed a management strategy evaluation to evaluate current and alternative harvest strategies in each management unit. From this exercise new harvest control rules for Yellow Perch were selected. These harvest control rules will form the foundation of the Yellow Perch Management Plan for the next 5 years. A graphical representation of the harvest control rule is shown in Figure 2. The harvest control rules are comprised of:

- Target fishing mortality as a percent of the fishing mortality at maximum sustainable yield (F_{msy})
- Limit reference point of the biomass at maximum sustainable yield (B_{msy})
- Probabilistic risk tolerance, P*=0.05
- A limit on the annual change in TAC of ±20%

Target fishing rates and limit reference points are estimated annually using results from the SCAA models. Limit reference points and target fishing rates for each management unit are presented in Table 3. Target fishing rates are reduced when the probability of the projected spawning stock biomass being equal to or less than the limit reference point (B_{msy}) is greater than 5% (P*). Target fishing rates are applied to population estimates and their standard errors, to determine minimum, mean, and maximum RAH values for each management unit (Table 4).

Table 3. Parameters used in the harvest control rule 2019. F actual may be reduced from F target if P*>5%.

MU	Spawning Stock Biomass			Limit Reference Point		Fishing Rate			
	SSB_0	2019	2020 *	B_{msy}	P*	F_{msy}	% F_{msy}	F_{target}	F_{actual} **
MU1	5,645,560	2,795,920	3,171,970	1,585,743	0.54%	2.38	28%	0.666	0.666
MU2	12,378,700	4,700,430	4,076,090	3,395,611	18.12%	2.06	35%	0.721	0.353
MU3	12,895,400	6,775,030	7,236,280	3,542,554	0.30%	2.03	32%	0.650	0.650
MU4	1,791,990	2,087,220	1,791,180	506,007	0.00%	1.46	34%	0.496	0.496

* Spawning stock biomass when population is fished at target fishing rate

** In MU2 fishing at F_{target} exceeds a 5% probability (P*) that the projected spawning stock biomass will be equal to or less than the limit reference point (B_{msy}), therefore the fishing rate was reduced until the probability was less than 5%.

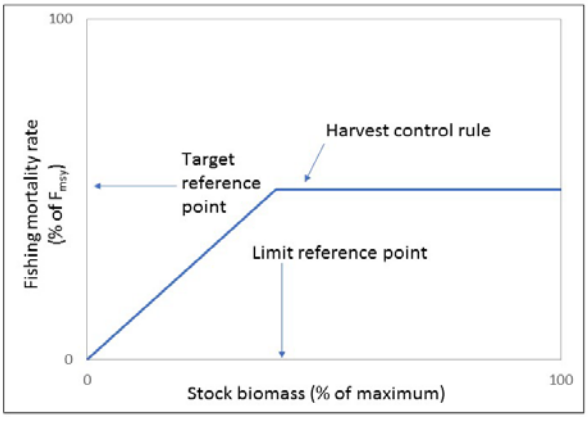

Figure 2. Representation of the harvest control rule for Lake Erie Yellow Perch

Table 4. Lake Erie Yellow Perch fishing rates and RAH (in millions of pounds) for 2019 by management unit.

MU	Fishing Rate	Recommended Allowable Harvest (millions lbs.) *		
		MIN	MEAN	MAX
1	0.666	1.742	2.240	2.739
2	0.353	1.620	1.914	2.208
3	0.650	2.734	3.374	4.015
4	0.496	0.720	0.883	1.047
Total		6.816	8.412	10.008

* RAH values may be subject to a limit on the annual change in TAC (±20%).

The complete YPTG report is available from the GLFC's Lake Erie Committee Yellow Perch Task Group website at: http://www.glfc.org/lake-erie-committee.php , or upon request from an LEC, Standing Technical Committee (STC), or YPTG representative.